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Ridgefield Brick and Tile

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**REPORT ON
CERTIFICATION OF CLOSURE
OF THE
RIDGEFIELD BRICK AND TILE SITE**

RIDGEFIELD, WASHINGTON

USEPA RCRA



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PATRICK H. WICKS, P.E.

Consultant in Hazardous Waste Management

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Department of Ecology
Southwest Regional Office

REPORT ON
CERTIFICATION OF CLOSURE
OF THE
RIDGEFIELD BRICK AND TILE SITE
Ridgefield, Washington

February 15, 1984

Submitted to:

Pacific Wood Treating Corporation
P.O. Box 518
Ridgefield, Washington 98642

Submitted by:

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In association with

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TABLE OF CONTENTS

	Page
INTRODUCTION	1
CERTIFICATION	3
REVISIONS TO CLOSURE PLAN	5
A. Revision to Soil Sampling and Analysis Procedures	5
B. Revision for Installation of Underdrain	6
C. Revision in Bentonite Requirement	7
D. Revision to Underdrain, Toe Drain Discharge and Final Grading	8
E. Revision to Fencing Installation	9
INSPECTIONS FOR CLOSURE CERTIFICATION	10
A. Inspections by Patrick H. Wicks	10
B. Inspections by H. Randy Sweet/Sweet, Edwards & Associates, Inc.	12
APPENDIX	
Site Safety and Operations Plan	
Site Exploration Plan	
Boring Logs (AH-1, 2, 3, 4)	
Soil Sampling Data Sheet/Chain of Custody Forms	
Boring Logs (on-site lysimeters, LS-1, 2, 3)	
Laboratory Results (soil samples)	
Access Agreement for Falls Drinking Water Well	
Report on Testing of Bentonite-amended Liner	
Soil Logs (Test pits at western margin of old disposal area)	
Final Topography - RBT Site, Option III	
Description/Color Photograph Reproductions	
References	

INTRODUCTION

Pacific Wood Treating Corporation and Elmer Muffet/Ridgefield Brick and Tile were notified by the Washington Department of Ecology (DOE) that the Ridgefield Brick and Tile (RBT) waste disposal site must be closed. This notice was given June 20, 1983 by the (DOE) in its Notice of Penalty No. DE 83-284, which required that the site be closed and imposed certain other requirements.

Pacific Wood Treating Corporation (PWT) retained Sweet, Edward & Associates, Inc. of Kelso, Washington and Patrick H. Wicks of Redmond, Washington as consultants to assist in design and implementation of the subject site closure, certification of the site closure and other matters related to this site.

Sweet, Edwards & Associates and Patrick H. Wicks prepared a draft closure plan for the RBT site, dated July 15, 1983. This plan addressed ground water monitoring and post-closure design and implementation as well as closure aspects. The plan was submitted to and reviewed by the DOE and the U.S. Environmental Protection Agency (EPA). DOE commented on the draft plan in its August 4, 1983 letter to PWT. Subsequently, a meeting was held August 18, 1983 among DOE, EPA, PWT, Sweet, Edwards & Associates and Patrick H. Wicks to discuss the plan. Following that meeting, an addendum to the draft closure plan was prepared and submitted to DOE and EPA for review and approval. Prior to and during preparation of the draft plan and the addendum thereto, several telephone conversations occurred among DOE and PWT personnel and the consultants to reach agreement on a number of details related to site closure. DOE verbally approved the draft closure plan as modified by the addendum prior to the start of closure construction. Verbal approval of the draft plan, addendum and revisions thereto

discussed below was imperative in this case to expedite completion of closure prior to the fall rainy season.

In addition, just prior to starting and during closure construction activities, other closure details and problems were resolved via telephone conversations amongst the same parties. Some of these details/problems constituted revisions to the approved draft closure plan and addendum. Accordingly, all such revisions which were verbally approved by DOE are listed in the REVISIONS TO CLOSURE PLAN section of this report. The consultants believe no other significant revisions to or departures from the approved draft closure plan/addendum were undertaken during the closure process, based on their numerous inspections of the site and conversations with PWT personnel and review of several hundred photographs taken prior to, during and after closure (see selected color photograph reproductions in APPENDIX).

It should also be noted that information contained in this report relates only to activities immediately prior to closure and during closure. Closure was completed October 17, 1983. Any activities subsequent to that date relating to this site are not included in this report, except for the November 16, 1983 final certification inspection.

This report consists principally of a CERTIFICATION section, a REVISIONS TO CLOSURE PLAN section, INSPECTIONS FOR CLOSURE CERTIFICATION section and the APPENDIX. In the APPENDIX are provided documentation of: soil borings, observations and test results; diagrammatic layout depicting post-closure features and facilities (RBT Site, Option III, Final Topography); reproductions of selected color photographs showing conditions prior to, during and after closure; references and; other relevant information.

CERTIFICATION

The DOE notice of penalty required certification by a registered professional engineer of the closure of the RBT site. The following page provides this certification, pursuant to the above-noted requirement and consistent with DOE and EPA regulations.

It should be noted that certification inspections by Patrick H. Wicks were timed to coincide with installations of the bottom liner, installation of the top liner and after completion of closure.

PATRICK H. WICKS, P.E.

Consultant in Hazardous
Waste Management

February 15, 1984

I, Patrick H. Wicks, a registered professional engineer, hereby certify, that I have made visual inspections of the Ridgefield Brick and Tile (RBT) site near Ridgefield, Washington, and closure of the aforementioned facility has been performed, to the best of my knowledge and belief, in accordance with the closure plan for the facility approved by the Washington Department of Ecology. The term "closure plan" as used above includes the July 15, 1983 draft closure plan, the August 22, 1983 addendum to draft closure plan and other revisions to these plans approved by the Washington Department of Ecology prior to and during the closure process. All such other revisions are detailed in this report.



REVISIONS TO CLOSURE PLAN

As noted previously in this report, all revisions to the closure plan which were approved by the DOE are listed and described in this section. As indicated in the preceding CERTIFICATION, the term "closure plan" as used in this report includes the July 15, 1983 draft closure plan and the August 22, 1983 addendum thereto. Subsequent revisions to the closure plan are as follows:

A. Revision to Soil Sampling and Analysis Procedures

A drilling program to collect soils samples adjacent to the preclosure waste area was requested by DOE. In order to carry out that drilling program, a Site Safety and Operation Plan was developed September 7, 1983. A copy of that plan is appended.

The purpose of the drilling was to obtain soil samples for elutriate testing and ensure that any adjacent contaminated soil would be removed and encapsulated with the waste. Sampling was carried out at the cemented gravel-soil interface and five foot intervals above that depth. Standard QA/QC procedures including steam cleaning of the drill auger and split spoon sampler were routinely carried out. Replicate samples were collected to allow for additional future testing of samples if necessary. All drilling and sampling work was conducted by Jim Maul, Craig Wells and Geoff Snyder of Sweet, Edwards & Associates.

Drilling was completed on September 14, 1983 and the samples transported to Laucks Testing Laboratories by PWT staff. Chain-Of-Custody and field drilling notes for the soil sampling work are appended. Initial soil testing results were reported to Sweet, Edwards and Associates by Barbara Gleason of Laucks on September 20, 1983 at 17:15 hours.

Data available on samples from auger holes 1 and 2 showed pentachlorophenol less than 1,000 PPB; napthalene less than 200 PPB; and arsenic less than 2 PPB. Final testing results are included in the APPENDIX.

Drilling and sampling procedures were agreed upon in a telephone conversation between Vince McQuiggin of PWT, Eric Egbers of DOE and Randy Sweet of Sweet, Edwards & Associates. Subsequent phone calls between the same parties on September 7 and 9, 1983 verified the soil concentration limits that must be met if the soil is to be left in place. Detection limits for testing purposes were also discussed.

	SOIL LIMIT(mg/l)	LAUCKS DETECTION LIMIT (mg/l)
Arsenic	5.0	.002
Penta chlorophenol	1.01	1.0
Napthlene	2.3	0.2

All testing was to be carried out as per SW-846 procedures. Method 8100 was to be used for napthalene, method 8040 for pentachlorophenol and the E.P. toxicity method for arsenic.

B. Revision for Installation of Underdrain

An underdrain was placed in the mica sand which underlies the compacted soil and bentonite-amended bottom liner for the new waste encapsulation area. Following drainage of the ponded area and during preparation for development of the bottom liner, it was found that the mica sand shown in earlier site diagrams exceeded 10 feet in depth. This was verified through backhoe test pits and the advancement of three drill holes (P1, P2, and P3) which showed the depth to the cemented gravel to range from 12 to 15 feet. In one

of the drill holes, a shallow perched water table at a depth of 5 to 6 feet was observed.

In order to ensure that seasonally perched ground water did not upwell and saturate the waste encapsulation area from the base, it was suggested that two underdrain lines be placed in 2 ft x 2 ft trenches with 4 inch perforated pipe and washed gravel backfill in order to provide a positive drain below the waste. This underdrain was to be installed so that it could bypass underdrain water unless contaminants were observed in that water, at which time it would be coupled to any toe drain holding tank and handled accordingly.

On September 14, 1983 this underdrain option was discussed with Eric Egbers of the DOE and approval was given to Randy Sweet of Sweet, Edwards & Associates to install the system as described. That installation was subsequently completed.

C. Revision in Bentonite Requirement

Substitution of SG-40 bentonite for a portion of the SS-100 bentonite specified for the bottom seal was necessary. During the course of closure the bottom liner was prepared for the bentonite admix prior to the arrival of enough SS-100 and TFS-80 bentonite.

The SS-100 and TFS-80 bentonite are both effectively equivalent according to Jim Koski, American Colloid representative in Corvallis, Oregon. However, a sufficient quantity of these materials was not available to complete the entire bottom liner. Therefore a lower contamination resistant material, SG-40 bentonite, was to be uniformly interspersed among the high contaminant resistant

bentonite. According to Koski, the SG-40 is 20 to 25 percent less resistant than the earlier prescribed material. This information was relayed to DOE staff. After discussing the options and realizing that time was of the essence, it was agreed that spacing the SG-40 material among the SS-100 and TFS-80 with improved spreading to ensure uniformity would be satisfactory.

On September 15, 1983 Rick Pierce of Washington DOE and Randy Sweet of Sweet, Edwards & Associates agreed to this revision in a telephone conversation.

D. Revision to Underdrain, Tow Drain Discharge and Final Grading

During placement of the waste on the bottom liner of the new encapsulation area it was determined that the crawler tractors were unable to compact the waste sufficiently as planned, due to the high moisture content of the waste. Accordingly, a large quantity of soil was placed over the waste for surcharge. This raised the elevation of the top of the new encapsulation area higher than planned relative to the toe drain and underdrain. As a result it was decided to run separate tight lines for the underdrain and toe drain from the point at which they exit the waste encapsulation area to the existing sump at the southwest corner of the warehouse. This allows for proper gravity drainage for the underdrain and toe drain as well as sampling access and future potential installation of a holding tank for leachate from the toe drain, if leachate exceeds water quality limits in the modified addendum, i.e., one-half the primary drinking water standard or; 0.0225 mg/l pentachlorophenol; 1.15 mg/l naphthalene or; 0.5 mg/l copper. As a result of these changes, it was also necessary to change the final grading of the site and the

sediment catch feature. These changes were related to Eric Egbers by Randy Sweet. Egbers indicated no objections to these changes. Refer also to the September 21 and 29 site inspection record of H. Randy Sweet.

E. Revision to Fencing Installation

The closure plan specified that a two strand barbed wire fence be installed around the new waste encapsulation area. On October 11, 1983, Vince McQuiggin proposed to Eric Egbers by telephone that a new two wire fence be installed only on the north and west sides thereof and that the existing single wire electrical fence be used on the south and east boundaries of the encapsulation area. Egbers agreed to this proposal on the condition that PWT install a fence in the spring of 1984 to enclose the entire property as planned. If PWT does not enclose the entire property, it would be necessary to add a two wire fence on the east and south sides of the encapsulation area.

INSPECTIONS FOR CLOSURE CERTIFICATION

Inspections of the RBT site were made on several occasions during closure, immediately prior to closure and after closure was completed for the purpose of certification of proper closure. Observations made and substantive discussion held during these inspections by Patrick H. Wicks and H. Randy Sweet are reported in this section. Other visits and inspections not relevant to closure certification are not reported here.

The following subsections described closure certification inspections.

A. Inspections by Patrick H. Wicks

1. September 19, 1983:

Upon arrival, observed that part of the bottom liner (seal comprised of clayey soil and bentonite, compacted) was completed. Part of the waste from old disposal area had been moved onto the new liner. Randy Sweet, Vince McQuiggin and the PWT contractor advised that the liner was being constructed in three phases. The first two phases had been completed and the third phase (the western-most portion) would be completed later that day or the next day. Inspected the on-site upgradient lysimeter and discovered that the above grade portion had been severed during grading of that area. Discussed repair and/or replacement with Randy Sweet, Vince McQuiggin and PWT contractor. Much of the remainder of the site had also been partially graded to achieve final contours, stockpiling of clayey soil and top cover soils.

In the old waste disposal area, water was ponded. Wood shavings were being added absorb to the water and were being moved with the waste to the new encapsulation area. Requested by Vince McQuiggin to prepare check list for guidance on all closure activities (this was prepared later with assistance of Randy Sweet and mailed to PWT on September 21, 1983).

2. September 20, 1983:

Observed that large backhoe had excavated to the bottom of the old waste disposal area as evidenced by dramatic change in color of underlying material in southeast portion of old disposal area. Note photographs taken on same day. The final portion of the bottom liner had been completed.

3. September 23, 1983:

Waste removal from old disposal area and placement of same in new encapsulation area had been completed. Additional grading had been completed. Top seal was being placed on new encapsulation area. Requested PWT contractor to excavate two test pits near western margin of old disposal area. Observation of these pits confirmed that no waste was present in this area below the surface. Refer to soil logs and photographs of these test pits.

4. September 24, 1983:

Soil surcharge and approximately 18" of top seal had been applied to new encapsulation area. PWT contractor advised soil was too dry. Water was being sprayed on seal to provide adequate moisture for good compaction. Vibratory compactor was working top seal and watering continuing as needed. PWT contractor planned addition of 12" clayey soil, water and compaction to finish top seal. Reminded

contractor that 18" additional uncompacted soil required over top seal.

5. November 16, 1983:

Final inspection made with Randy Sweet. Ed Ryf, Vince McQuiggin and Rich Brown also present at site. Inspected perimeter of site, fencing, three on-site monitoring well/lysimeters, groundcover/seeding, final grading, drainage ditches, toe drain risers, gas vents, toe drain and underdrain tight lines and manhole/sump. All appeared to be in order, except for settlement of soil in tight line trench, excessive runoff entering manhole/sump, settlement of soil around gas vents and some soil erosion in several areas. Immediate repair or correction on these exceptions were recommended to PWT personnel, weather and soil conditions permitting.

B. Inspections by H. Randy Sweet/Sweet, Edwards & Associates, Inc.

1. September 12, 1983:

Inspected drilling activities to determine adequacy of sample return and procedures. Also reviewed lysimeter installation procedures with drilling crew.

2. September 15, 1983:

Inspected contractor activities and bottom liner compaction with Jim Maitland and Ed Ryf.

3. September 15, 1983:

Return to site for inspection of bentonite placement and soil compaction testing procedures by Jim Maitland.

Discussed application techniques and observed rotavating and subsequent compaction. Foundation Engineering (Maitland) report on bentonite admix and compaction testing appended.

4. September 16, 1983:

Inspected site and discussed waste movement onto completed bottom liner with Ed Ryf and contractor. Noted that waste placement was not in shallow lifts with complete compaction as defined in the plan. Contractor stated that the moisture content of the waste precluded such compaction as the cat would become stuck. Contractor and Ryf suggested that placing additional soil on top of the waste as the lift was built up would provide for a surcharge and the necessary compaction. Noted that leachate generation, subsidence and subsequent maintenance requirements may be increase due to the reduced compaction. It was agreed however, that there was no reasonable alternative since spreading the waste and allowing it to dry could take months. Also, any leachate generated would migrate across the bottom liner to the toe drain and be readily collectable.

Also noted that the waste being moved out of the fill area to the encapsulation area was changing in character. Ryf and contractor stated that discussions with Elmer Muffet and others had indicated that a great deal of soil and land clearing material had been pushed into the area near the tile plant before the site was used by PWT. This waste included limbs and gleyed clayey soils as opposed to the wood and banding common to the PWT materials.

Some water was encountered in the deeper portion of the fill excavation. In order to allow continued movement of that material, wood shavings were being dumped into the water to absorb the water and then the saturated shavings were

pushed together with the waste to the encapsulation area. Concomitantly, a track backhoe was being used to excavate along the waste perimeter and determine the extent of the plant contaminated wastes. This proved to be a practical way to determine limits of necessary excavation. This visual inspection was coupled to the earlier drilling and soil elutriate testing as discussed earlier with DOE staff.

5. September 19, 1983:

Site inspection with Vince McQuiggin and Patrick Wicks to review progress of waste movement and general construction.

6. September 19, 1983:

Site inspection with Patrick Wicks to again review the progress of waste movement and soil cover placement as well as to discuss the development of a site check list for use by McQuiggin and Ryf in determining completion of specific tasks.

7. September 21, 1983:

Noted placement of deeper soil to facilitate surcharge on waste, as described earlier, was effectively complete. Toe drain was being put in place, but due to the deeper soil cover a change was requested by Ryf to tight line the underdrain and toe drain discharge lines to the existing sump at the southwest corner of the warehouse.

8. September 23, 1983:

Site inspection with Wicks to view the effectively complete earth placement and grading. Installation of the toe drain and underdrain tight lines were not yet completed.

9. September 29, 1983:

Site inspection to view progress. Contractor had moved off of site and all grading, etc. was effectively completed. Subsequently discussed change in the upgradient cutoff ditching system with Ryf and based on his knowledge of area soils, agreed that running the side ditches approximately 45 feet downgradient from the toe drain area and fanning out the discharge would be acceptable. However, it was emphasized to Ryf & McQuiggin that the purpose of the design with the sediment catch basin was to ensure positive moisture routing and minimize erosion and sediment run-off.

10. November 16, 1983:

Meeting at site with Patrick Wicks, Ed Ryf, Vince McQuiggin and Rich Brown. Noted that seeding had been completed and was reasonably successful considering the low fertility of the soil and the extreme recent precipitation. Several areas for repair actions were noted and discussed with PWT staff including subsidence of soil in the immediate vicinity of the gas vents. Some minor erosion related to runoff was observed in various locations including the upgradient cut-off ditch. Suggested to Ryf that several hay bales be kept on-site to allow plugging of rills and mitigation of erosion problems as they develop. Additional subsidence and erosion was noted above the tight line as a result of backfill settlement. Sediment erosion had filled in the tight line sump at the southwest corner of the warehouse. It was suggested that the sump be dug out and that additional grout or fill be placed along the outside of the pipe since water was noted seeping into the sump around the edge of the pipe. Finally, it was recommended to Ryf that perforations be placed near the top of the gas vents to facilitate venting of any gas accumulations.

APPENDIX

SITE SAFETY AND OPERATIONS PLAN

SITE: Pacific Wood Treating/RBT Site DATE: September 7, 1983
LOCATION: Ridgefield Brick & Tile PREPARED BY: J. Maul
 289th Street H. R. Sweet
 Ridgefield, WA

PROJECT OBJECTIVE(S): Drilling, soils sampling, instrumentation

SCHEDULED ACTIVITIES/TIME PERIOD: September, 1983

=====

BACKGROUND REVIEW

	PRELIMINARY	COMPLETE
ACCESS, OVERHEAD/UNDERGROUND UTILITIES, ETC.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
WASTE CHARACTERIZATION	<input type="checkbox"/>	<input checked="" type="checkbox"/>
HAZARD/PRECAUTION DETERMINATION	<input checked="" type="checkbox"/>	<input type="checkbox"/>

COMMENTS: Sampling to date of water indicates no parameters exceeding Primary Drinking Water Standards. Soil may include some heavy metals and/or dust.

=====

WASTE TYPE(S) / CHARACTERISTICS

LIQUID	<input type="checkbox"/>	SOLID	<input checked="" type="checkbox"/>	SLUDGE	<input type="checkbox"/>	GAS	<input type="checkbox"/>
CORROSIVE	<input type="checkbox"/>	IGNITABLE	<input type="checkbox"/>	REACTIVE	<input type="checkbox"/>	VOLATILE	<input type="checkbox"/>
TOXIC	<input type="checkbox"/>	RADIOACTIVE	<input type="checkbox"/>	UNKNOWN	<input type="checkbox"/>	OTHER	<input type="checkbox"/>

SPECIAL CONSIDERATIONS/COMMENTS: Some bottom and fly ash, yard cleanup and banding, etc.



Sweet, Edwards & Associates, Inc.

=====

FACILITY DESCRIPTION

SIZE: ± 6 acres BUILDINGS/STRUCTURES: Brick Plant

TOPOGRAPHY/ACCESS: Site roads paved, ground firm, slightly sloping.

GENERAL GEOLOGIC/HYDROLOGIC SETTING: Gee Creek soils overlying Troutdale
gravels

STORAGE/DISPOSAL METHOD(S): Landfill in abandoned clay borrow pit.

STATUS (active; closed; unknown) : Closed

HISTORY (injury; illness; complaints, public or agency) : None

SPECIAL CONDITIONS/COMMENTS: Some minor putrescible promiscuous dumping
by neighbors at site.

=====

HAZARD EVALUATION

Low hazard except for potential blowing dust with heavy metals. If dry and
dusty, use appropriate particulate mask.



Sweet, Edwards & Associates, Inc.

=====

OPERATIONS PLAN

MAP/SITE SKETCH ATTACHED AS EXHIBIT 1.

SITE CONTROL (for vehicles, workers, public, etc.) SHOWN ON EXHIBIT 1.

ZONES OF CONTAMINATION: ☐ Known ☒ Projected ☐ Unknown

COMMENTS: Access limited by owner, gate at south entrance, fence along three
sides and owner lives adjacent to site.

EXCAVATION, DRILLING OR SAMPLING METHOD: Solid stem auger with split
spoon sampling.

=====

SAFETY EQUIPMENT AND PROCEDURES

LEVEL OF PROTECTION: ☐ A ☐ B ☐ C ☒ D

ADDITIONS/MODIFICATIONS: Dust masks if necessary.

SPECIAL SURVEILLANCE EQUIPMENT AND MATERIALS: None necessary, drilling
outside old fill area.

DECONTAMINATION PROCEDURES: Steam clean drilling equipment, clothing/coverall
change, boot cleaning area.

P.D.S. STATION(S): Steam cleaner and clean water at the old plant (on-site).

P.D.S. EQUIPMENT, MATERIALS AND SPECIAL FACILITIES: Steam cleaner
and clean water.



Sweet, Edwards & Associates, Inc.

SITE ENTRY PROCEDURES

SITE TEAM (No.): 3 Sweet-Edwards Client Agency Other

ENTRY BRIEFING DATE: 9/8/83 LOCATION: Site

SITE WORK TEAM (name/responsibility) 1. J. Maul/ driller/geologist

2. G. Snyder/ Assistant geologist 3. C. Wells/ driller/geologist

4. _____

5. _____

6. _____ 7. _____

SPECIAL CONDITIONS (e.g., work schedule or limitations): None

.....

EMERGENCY PROCEDURES

ACUTE EXPOSURE SYMPTOM(S):

FIRST AID

1. None

4. _____

5. _____

6. _____

HOSPITALS/POISON CONTROL CENTERS (address/telephone number) :

1. St. Joseph Community Hospital/600 N.E. 92nd Ave., Vancouver/256-2064.

2. Vancouver Memorial Hospital/3400 Main, Vancouver/696-5232.

EMERGENCY TRANSPORTATION (fire, ambulance, police):

1. Ridgefield Fire Department/911

2. Ridgefield Police/911

3. Clark Co. Sheriff/911



Sweet, Edwards & Associates, Inc.

EMERGENCY ROUTES:

1. St. Josephs=289th St. east-31st Ave. south-269th east-I-5 south-I-205 south-Mill
2. Vancouver Mem.=289th St. east-31st Ave. south-269th east-I-5 south-Main St. south. Plain west.
3. _____
4. _____

=====

SAFETY/HEALTH EQUIPMENT CHECKOUT LIST

GENERAL SAFETY:

First Aid Kit _____	<input checked="" type="checkbox"/>	Eye Wash Station _____	<input checked="" type="checkbox"/>
Safety Glasses/Face Shield _____	<input checked="" type="checkbox"/>	Drinking Water _____	<input checked="" type="checkbox"/>
Safety Shoes/Gloves _____	<input checked="" type="checkbox"/>	_____	<input type="checkbox"/>
Personal Clothing Change _____	<input checked="" type="checkbox"/>	_____	<input type="checkbox"/>
Wash/Decontamination Materials <input checked="" type="checkbox"/>		_____	<input type="checkbox"/>

SITE SPECIFIC:

☒ Respirator:
Type (dust, cartridge, SCBA, etc.) Dust

☐ Explosimeter

☐ Oxygen Indicator

☐ Dosimeter Badge(s)

☐ Radiation Survey Meter

☐ _____

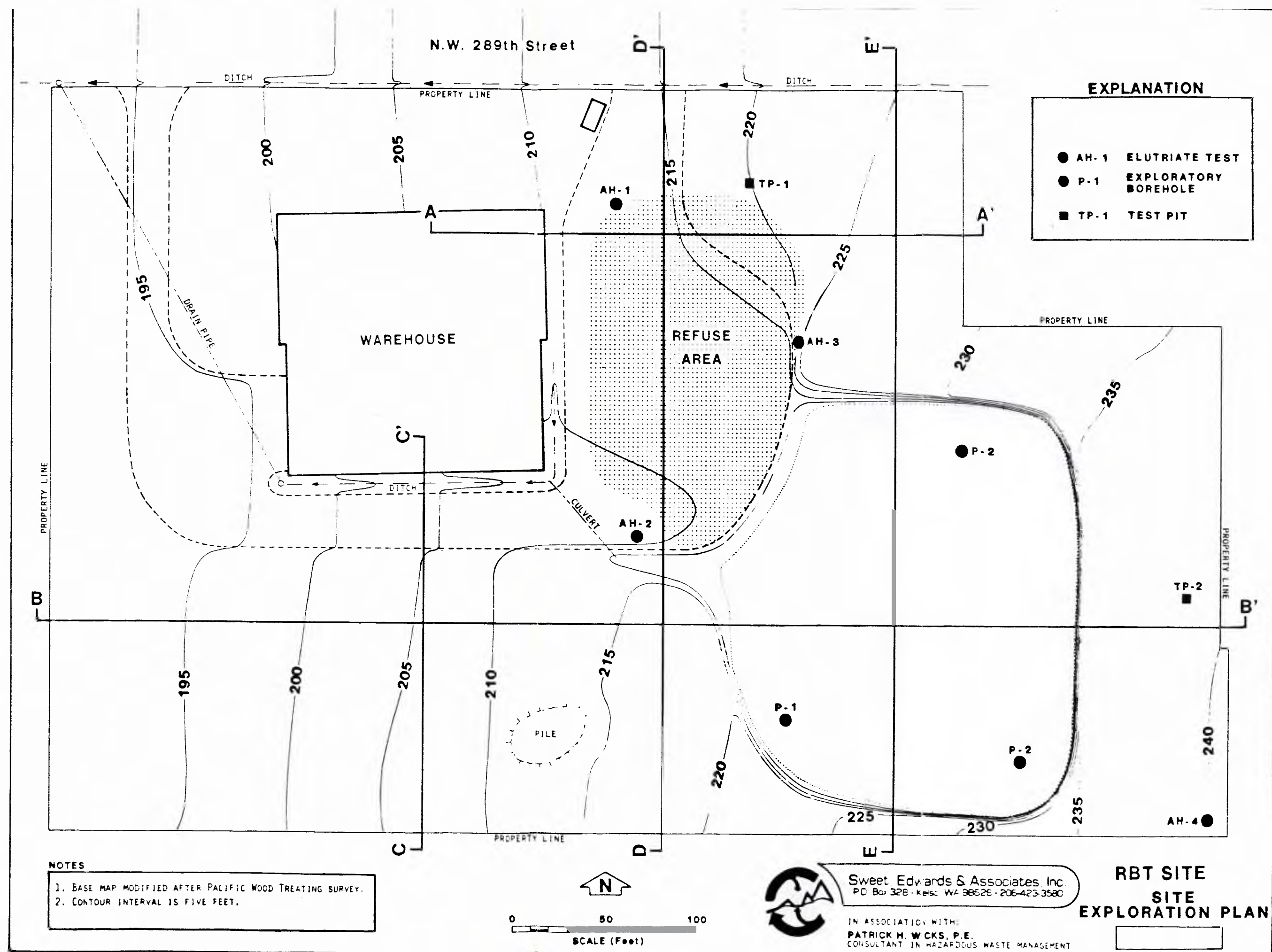
☐ _____

SPECIAL CONDITIONS/COMMENTS: Low hazard heavy metals site, minor potential
for creosote exposure.

Note: All Sweet-Edwards personnel are to understand and comply with specific practices and guidelines as described in the QA/QC Manual regarding field safety and health hazards.



Sweet, Edwards & Associates, Inc.





Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT NAME Pacific Wood Treating / RBTPROJECT NUMBER _____ BORING NUMBER AH-1DATE OF BORING 9/8/83GROUND ELEVATION AT BORING WHEN DRILLED 225 ft. msl (USGS quad.)

SAMPLE DATA				▲ STANDARD PENETRATION RESISTANCE, N. BLOWS/FOOT	WATER TABLE	SYMBOL	SOIL AND ROCK DESCRIPTION AND COMMENTS
DEPTH, FEET	NUMBER	LOCATION	CLASS SYMBOL				
				0	50	100	
	1a 1b		CL				3.3'-5.0' <u>Silty Clay</u> - mottled, tan-brown, hard, stiff.
-5							5.0'-6.0' As above.
	1-2a 1-2b		CL				8.3'-10.0' As above.
-10							
	1-3a 1-3b		ML				13.3'-15.0' <u>Clayey Silt</u> - mottled grey-reddish brown, stiff, crumbly.
-15							
	1-4a 1-4b		ML				20.9'-22.4' <u>Clayey Silt</u> - orange/ brown, slightly mottled, angular fracture.
-20							Gravels at 23 ft.
-25							
-30							



Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT NAME Pacific Wood Treating / RBT

PROJECT NUMBER BORING NUMBER AH-2

DATE OF BORING 9/8/83 and 9/9/83

GROUND ELEVATION AT BORING WHEN DRILLED 210 ft. msl (USGS quad.)

SAMPLE DATA				STANDARD PENETRATION RESISTANCE, N. BLOWS/FOOT	WATER TABLE	SYMBOL	SOIL AND ROCK DESCRIPTION AND COMMENTS
DEPTH, FEET	NUMBER	LOCATION	CLASS SYMBOL				
				0 50 100			
5	2-1a 2-1b		ML				3.3'-4.8' Silty Clay- Mottled, tan to brownish orange, stiff.
10	2-2a 2-2b		ML				8.5'-10.0' As above.
15	2-3a 2-3b		ML				13.5'-15.0' As above.
20	2-4a 2-4b		ML				18.5'-20.0' As above, earthy tan- brown. Gravels at 20 ft.
25							
30							



Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT NAME Pacific Wood Treating / RBT

PROJECT NUMBER BORING NUMBER AH-3

DATE OF BORING 9/9/83

GROUND ELEVATION AT BORING WHEN DRILLED 220 ft. msl (USGS quad)

SAMPLE DATA				STANDARD PENETRATION RESISTANCE, N. BLOWS/FOOT	WATER TABLE	SYMBOL	SOIL AND ROCK DESCRIPTION AND COMMENTS
DEPTH, FEET	NUMBER	LOCATION	CLASS SYMBOL				
				0 50 100			
5							
10	3-1		CL	▲			11.0'-12.3' <u>Silty Clay</u> - tan to reddish brown, moist, pyrolusite nodules
15	3-2		CL	▲			17.5'-19.2' <u>Silty Clay</u> - orangish red, oxidized, some tan streaks, moist, sticky.
20	3-3a 3-3b		SM- ML				22.5'-24.2' <u>Gravelly Silty Sand</u> , <u>Sandy Silt</u> - tan to orangish brown, trace mica, weathered clasts.
25							Gravels at 24 ft.
30							Trace water in bottom of hole.



Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT NAME Pacific Wood Treating / RBT

PROJECT NUMBER

BORING NUMBER AH-4

DATE OF BORING 9/12/83

GROUND ELEVATION AT BORING WHEN DRILLED 235 ft. (USGS quad)

SAMPLE DATA				▲ STANDARD PENETRATION RESISTANCE, N. BLOWS/FOOT	WATER TABLE	SYMBOL	SOIL AND ROCK DESCRIPTION AND COMMENTS
DEPTH, FEET	NUMBER	LOCATION	CLASS SYMBOL				
				0 50 100			
10							
20							
30							
40	4-1a 4-1b		SM	▲			43.5'-45.2' <u>Silty Sand</u> - tanish orange, streaks of orange mica, feldspathic, medium to fine sand unsaturated.
50	4-2a 4-2		SM	▲			52.5'-54.2' <u>Sand</u> - orange to tan streaks, heavily oxidized, trace silt, no mica.
60							Sand at 41.5 ft. Gravels at 54.5 ft.

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KELSO, WASHINGTON 98626

JOB PWT / PBT Site
SHEET NO. 1 OF 2
CALCULATED BY Ham DATE 9/14/83
CHECKED BY _____ DATE _____
SCALE _____

AH-1 GRAVEL AT 23'

AH-2 GRAVEL AT 20'

AH-3 GRAVEL AT 25'

AH-4 GRAVEL AT 54.5'

MICA SAND AT ~41.5' (BASED UPON DECREASED DRILLING RESISTANCE)

P-1 GRAVELS AT 12'

P-2 GRAVEL AT 13'

P-3 GRAVEL AT 15'

SOILS LOG

AH-1 3.3-5 SILTY CLAY, ^{slightly} mottled tan-brown, stiff

5.05-6.05 AS ABOVE

8.3-10. AS ABOVE

12.3-15 CLAYEY SILT, slightly mottled grey-reddish brown, crumbly

20.4-22.4 CLAYEY SILT, orangish brown, angular fracture

AH-2 3.3-4.8 SILTY CLAY - mottled tan-brown, ^{ish-orange} stiff

8.5-10 SAME

13.5-15 SAME - EARTHY TAN

18.5-20 SAME - orangish brown, oxidized, slightly more silt.

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JOB PWT / RBT SITE

SHEET NO. 2 OF 2

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

AH-3 WASTE TO 10.5' - Perched water below waste interring hole

11-12.3 SILTY CLAY, tan to reddish brown, moist.

17.5-19.25 AS ABOVE, ORANGE-ISH RED, oxidized some tan streaks, moist, sticky.

22.5-24.25 GRAVELLY SILTY SAND BELOW 4" ^{SILTY} SAND, tan-orangeish brown, GRAVELS moderately weathered, slightly indurated, sand graded medium fine, trace mica. ~~Trace~~



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Environmental Geology, Ground Water, Engineering Geology & Drilling Services

Well or Surface Site Number AM-1

Date, Time 9/8/83, 1400

SOIL SAMPLING
**SURFACE AND GROUND WATER SAMPLING
FIELD DATE SHEET**

PROJECT PWT, RBT SITES

CLIENT PACIFIC WOOD TREATING

WEATHER SHOWERS, CLOUDY

HYDROLOGY MEASUREMENTS:

Depth to Water Below Measuring Point: N/A

(Nearest .01 ft.)	Elevation	Date, Time	Method Used, M-Scope Number or Other

WELL EVACUATION: N/A

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time

Surface Water Flow Speed Measurement Method Date, Time

SAMPLING:

Sample Number	Date, Time	Volume (ml)	Container Type	Depth Taken	Filtered (yes,no)	Preservative	Iced (yes,no)	Sampler Cleaning Method
<u>1-1A ✓</u>	<u>9/8, 1403</u>	<u>1 qt</u>	<u>9/255</u>	<u>3.3-5.05</u>	<u>N/A</u>	<u>NO</u>	<u>NO</u>	<u>STEAM CLEANED</u>
<u>1-1B</u>	<u>9/8, 1430</u>	<u>"</u>	<u>"</u>	<u>5.05-6.05</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
<u>1-2A ✓</u>	<u>9/8, 1455</u>	<u>"</u>	<u>"</u>	<u>8.3-9.3</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
<u>1-2B</u>	<u>" "</u>	<u>"</u>	<u>"</u>	<u>9.3-10</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>

FIELD WATER QUALITY TESTS: N/A

Sample Number	pH (mg/L)	DO (mg/L)	Specific Conductivity	Temp				
<u>1-3A ✓</u>	<u>9/8, 1535</u>	<u>1 qt</u>	<u>9/255</u>	<u>13.3-14.3</u>	<u>N/A</u>	<u>NO</u>	<u>NO</u>	<u>steam cleaned</u>
<u>1-3B</u>	<u>" "</u>	<u>"</u>	<u>"</u>	<u>14.3-15.0</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
<u>1-4A ✓</u>	<u>" 1615</u>	<u>"</u>	<u>"</u>	<u>20.4-21.65</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>
<u>1-4B</u>	<u>" 1615</u>	<u>"</u>	<u>"</u>	<u>21.65-22.4</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>

TRANSPORT AND CUSTODY:

SEA Field Personnel	Other Field Personnel	Sample Number	Container Number	Transport To Lab By	Shipped To Lab By	Shippers Lading Number
<u>km, GWS</u>				<u>By: GP</u>	<u>By: VFM</u>	
				<u>PWTE</u>	<u>PWTC</u>	

Date of Shipment 9-12-83

Time of Shipment 8:30 AM

Signature of SEA
or Other Personnel

Date

James J. Mart

9/8/83



Well or Surface Site Number AH-2

Date, Time 9/4/83, 0715

Soil Sampling

SURFACE AND GROUND WATER SAMPLING FIELD DATE SHEET

PROJECT PWT-RBT SITE CLIENT PACIFIC WOOD TREATMENT

WEATHER SUNSHINE / PARTLY FOG

HYDROLOGY MEASUREMENTS:

Depth to Water Below Measuring Point: N/A

(Nearest .01 ft.)	Elevation	Date, Time	Method Used, M-Scope Number or Other

WELL EVACUATION: N/A

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time

Surface Water Flow Speed Measurement Method Date, Time

SAMPLING:

Sample Number	Date, Time	Volume (ml)	Container Type	Depth Taken	Field Filtered (yes, no)	Preservative	Iced (yes, no)	Sampler Cleaning Method
<u>2-1A</u> ✓	<u>9/4/83, 0750</u>	<u>14</u>	<u>4/215</u>	<u>3.3-4.05</u>	<u>N/A</u>	<u>NO</u>	<u>NO</u>	<u>Steam clean</u>
<u>2-1B</u>	<u>" "</u>	<u>"</u>	<u>"</u>	<u>4.05-4.8</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>" "</u>
<u>2-2A</u> ✓	<u>" 0824</u>	<u>"</u>	<u>"</u>	<u>8.5-9.25</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>" "</u>
<u>2-2B</u>	<u>" 0824</u>	<u>"</u>	<u>"</u>	<u>9.25-10</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>" "</u>

FIELD WATER QUALITY TESTS:

Sample Number	pH (mg/l)	DO (mg/l)	Specific Conductivity	Temp.				
<u>2-3A</u> ✓	<u>9/6, 0848</u>	<u>14</u>	<u>9155</u>	<u>13.5-14.25</u>	<u>N/A</u>	<u>NO</u>	<u>NO</u>	<u>Steam clean</u>
<u>2-3B</u>	<u>" "</u>	<u>"</u>	<u>"</u>	<u>14.25-15.0</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>" "</u>
<u>2-4A</u> ✓	<u>" 0911</u>	<u>"</u>	<u>"</u>	<u>18.5-19.25</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>" "</u>
<u>2-4B</u>	<u>" "</u>	<u>"</u>	<u>"</u>	<u>19.25-20</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>" "</u>

TRANSPORT AND CUSTODY:

SEA Field Personnel	Other Field Personnel	Sample Number	Container Number	Transport To Lab By:	Shipped To Lab By:	Shippers Lading Number
<u>Am, GWS</u>				<u>By: <u>EL</u></u>	<u>By: <u>VFM</u></u>	
				<u>PWTC</u>	<u>PWTC</u>	

Date of Shipment 9-12-83 Time of Shipment 8:30 AM

Signature of SEA
or Other Personnel

James J. Marshall

Date

9/8/83

V.S. Guxton



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Environmental Geology, Ground Water, Engineering Geology & Drilling Services

Well or Surface Site Number AH 3

Date, Time 9/9/83, 1400

SOIL SAMPLING

SURFACE AND GROUND WATER SAMPLING FIELD DATE SHEET

PROJECT PWT - RBT SITE

CLIENT PACIFIC WOOD TREATING

WEATHER Sunny

HYDROLOGY MEASUREMENTS: U/A

Depth to Water Below Measuring Point:

(Nearest .01 ft.)	Elevation	Date, Time	Method Used, M-Scope Number or Other
/	/	/	/
/	/	/	/
/	/	/	/
/	/	/	/

WELL EVACUATION: U/A

Gallons	Pore Volumes	Method Used	Rinse Method	Date, Time
/	/	/	/	/
/	/	/	/	/
/	/	/	/	/
/	/	/	/	/

Surface Water Flow Speed	Measurement Method	Date, Time

SAMPLING:

Sample Number	Date, Time	Volume (ml)	Container Type	Depth Taken	Field Filtered (yes,no)	Preservative	Iced (yes,no)	Sampler Cleaning Method
3-1 ✓	9/9, 1406	1/2 qt	g/255	11-12.3	N/A	No	No	sterilize
3-2A ✓	9/9, 1445	1 qt	"	17.5-18.5	"	"	"	" "
3-2B	" "	"	"	18.5-19.5	"	"	"	" "
3-3A ✓	" 1631	"	"	22.5-23.5	"	"	"	" "
3-3B	" "	"	"	23.25-24.25	"	"	"	" "

FIELD WATER QUALITY TESTS:

Sample Number	pH (mg/l)	DO (mg/l)	Specific Conductivity	Temp

TRANSPORT AND CUSTODY:

SEA Field Personnel	Other Field Personnel	Sample Number	Container Number	Transport To Lab By:	Shipped To Lab By:	Shippers Lading Number
				By: <u>PK</u>	By: <u>VFM</u>	
				<u>PWTe</u>	<u>PWTe</u>	

Date of Shipment 9-12-83

Time of Shipment 8:30 AM

Signature of SEA or Other Personnel

James J. Marshall

Date

9/9/83



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Environmental Geology, Ground Water, Engineering Geology & Drilling Services

Well or Surface Site Number A11-41

Date, Time 9/13/83, 0839

**SURFACE AND GROUND WATER SAMPLING
FIELD DATE SHEET**

PROJECT RBT SITE

CLIENT PACIFIC WOOD TREATING

WEATHER clear

HYDROLOGY MEASUREMENTS:

Depth to Water Below Measuring Point: NA

(Nearest .01 ft.)

Elevation

Date, Time

Method Used, M-Scope Number or Other

WELL EVACUATION: NA

Gallons

Pore Volumes

Method Used

Rinse Method

Date, Time

Surface Water Flow Speed

Measurement Method

Date, Time

SAMPLING:

Sample Number	Date, Time	Volume (ml)	Container Type	Depth Taken	Field Filtered (yes,no)	Preservative	Iced (yes,no)	Sampler Cleaning Method
4-1A	9/13, 0835	145	4/255	435-443	NA	NO	NO	Steam Clean
4-1B	"	"	"	442-45.25	"	"	"	"
4-2A	9/13, 1104	"	"	52.5-53.3	"	"	"	"
4-2B	"	"	"	53.3-54.25	"	"	"	"

FIELD WATER QUALITY TESTS:

Sample Number	pH (mg/l)	DO (mg/l)	Specific Conductivity	Temp

TRANSPORT AND CUSTODY:

SEA Field Personnel	Other Field Personnel	Sample Number	Container Number	Transport To Lab By	Shipped To Lab By	Shippers Lading Number
JM + GMS		4-1	2(A)	DAL		
		4-2	2(B)			

Date of Shipment

9/15/83

Time of Shipment

8:57 - 139 PM

Signature of SEA
or Other Personnel

James / Marshall

Date

9/13/83



PROJECT Pacific Wood Treating / RBT Site

Page 1 of 1

Location Ridgefield Brick & Tile

Boring No. LS-1

Surface Elevation

Drilling Method Auger

Total Depth 54.5 ft.

Drilled By Sweet, Edwards & Assoc.

Date Completed 9/12/83

Logged By J. Maul

WELL DETAILS	PENE- TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE		PERME- ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
			NO.	TYPE				
Bentonite Pellets		10						
Native Soil Backfill		20						
1.5 in. PVC riser		30						
		40						
Bentonite Pellets		50	4-1A 4-1B 4-2A 4-2B				43.5'-45.25' <u>SILTY SAND</u> - Tanish orange, lenses of feldspathic mica sand, medium fine, unsaturated. 52.0'-54.25' <u>SAND</u> - Orange and tan streaks, heavily oxidized, trace silt. Gravels at 54.5'. Auger refusal. Suction lysimeter installed at 52.0'.	
Native Soil Slurry		60						
		70						



PROJECT Pacific Wood Treating / RBT Site

Page 1 of 1

Location Ridgefield Brick and Tile

Boring No. LS-2

Surface Elevation

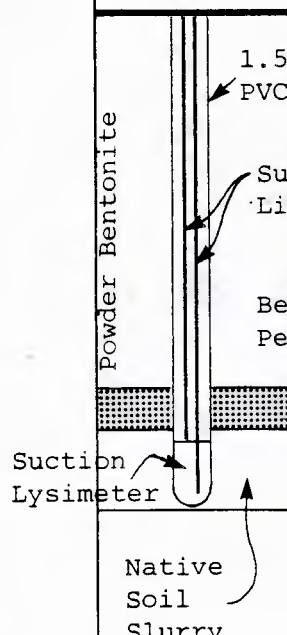
Drilling Method Auger

Total Depth 15.0 ft.

Drilled By Sweet, Edwards & Assoc.

Date Completed 9/28/83

Logged By J. Maul

WELL DETAILS	PENE- TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE		PERME- ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
			NO.	TYPE				
			1	SP		CL	2.5'-4.0' <u>SILT CLAY</u> - Grey to tan, slight mottling, hard, dry, black nodules.	
		5	2	"		CL	7.5'-9.0' <u>SILTY CLAY</u> - Grey to tan, increased mottling, larger more abundant nodules, moist.	
		10	3	SP		ML	12.5'-14.0' <u>SILT</u> - Tan with some orange streaking, trace fine sand.	
		15					Gravels at 15.0 ft. Auger refusal.	
		20					Suction lysimeter installed at 15.0 ft.	
		25						
		30						



PROJECT Pacific Wood Treating / RBT Site

Page 1 of 1

Location Ridgefield Brick and Tile

Boring No. LS-3

Surface Elevation _____

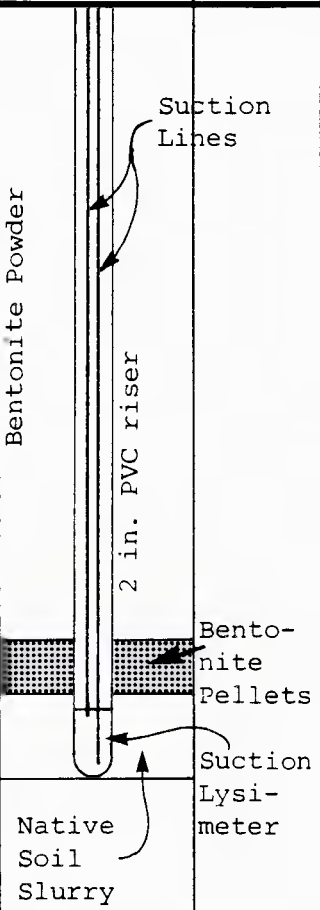
Drilling Method Auger

Total Depth 23.5 ft.

Drilled By Sweet, Edwards & Assoc.

Date Completed 9/28/83

Logged By J. Maul

WELL DETAILS	PENE- TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE		PERME- ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
			NO.	TYPE				
		5	1	SP		ML	3.5'-5.0' <u>CLAYEY SILT</u> - Brown to greyish tan, hard.	
		10	2	"		ML	8.5'-10.0' <u>CLAYEY SILT</u> - Heavy mineral staining (black), slightly oxidized.	
		15	3	"		ML	13.5'-15.0' <u>CLAYEY SILT</u> - Increased oxidation, slightly mottled.	
		20	4	"		ML	18.5'-20.0' <u>CLAYEY SILT</u> - Brownish orange, some grey, black mineral precipitation.	
		25					Gravels at 23.5'. Auger refusal. Suction lysimeter installed at 23.5'.	
		30						

Laucks

Testing Laboratories, Inc.

940 South Harney Street, Seattle, Washington 98108 (206) 767-5060

Chemistry, Microbiology, and Technical Services

RECEIVED
OCT 03 1983
P. W. T.



Certificate

CLIENT Pacific Wood Treating
111 W. Division St.
Ridgefield, WA 98642
ATTN: Vince McQuiggin

LABORATORY NO 82159

DATE Sept. 30, 198

PO# 42228

REPORT ON SOIL

SAMPLE
IDENTIFICATION

Submitted on 9/12/83 by Sweet Edwards Associates and
marked as shown below:

TESTS PERFORMED
AND RESULTS:

1)	1-1A	9/8	14:09
2)	1-2A	9/8	15:00
3)	1-3A	9/8	15:32
4)	1-4A	9/8	16:19
5)	1-1B	9/8	14:38
6)	1-2B	9/8	15:00
7)	1-3B	9/8	15:35
8)	1-4B	9/8	16:20
9)	2-1A	9/9	7:47
10)	2-1B	9/9	7:47
11)	2-2A	9/9	8:24
12)	2-2B	9/9	8:24
13)	2-3A	9/9	8:48
14)	2-3B	9/9	8:48
15)	2-4A	9/9	9:11
16)	2-4B	9/9	9:11
17)	3-1	9/9	14:06
18)	3-2A	9/9	14:45
19)	3-2B	9/9	14:45
20)	3-3A	9/9	16:31
21)	3-3B	9/9	16:31

Submitted 9/13/83 and marked as shown below:

22)	4-1A	9/13	8:39
23)	4-2A	9/13	11:09

Sample numbers 1,2,3,4,9,11,13,15,17,18,20,22 and 23 were analyzed
with results as shown below. All other samples were placed on hold
pending your instructions.



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PAGE NO. 2

Pacific Wood Treating

LABORATORY NO. 82159

This material was analyzed in accordance with 40 CFR 261.24 for EP Toxicity (arsenic only), with results as shown below:

	<u>parts per billion (ug/L)</u>				
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>9</u>
Arsenic	L/2.	L/2.	L/2.	L/2.	L/2.
	<u>11</u>	<u>13</u>	<u>15</u>	<u>17</u>	<u>18</u>
Arsenic	L/2.	L/2.	L/2.	12.	L/2.
	<u>20</u>	<u>22</u>	<u>23</u>		
Arsenic	L/2.	L/2.	L/2.		

This material was further analyzed in accordance with USEPA, Test Methods for Evaluating Solid Waste (SW-846), with results as shown below:

	<u>parts per billion (ug/kg), dry basis</u>				
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>9</u>
Pentachlorophenol	L/1000.	L/1000.	L/1000.	L/1000.	L/1000.
Naphthalene	L/200.	L/200.	L/200.	L/200.	L/200.
	<u>11</u>	<u>13</u>	<u>15</u>	<u>17</u>	<u>18</u>
Pentachlorophenol	L/1000.	L/1000.	L/1000.	L/1000.	L/1000.
Naphthalene	L/200.	L/200.	L/200.	L/200.	L/200.
	<u>20</u>	<u>22</u>	<u>23</u>		
Pentachlorophenol	L/1000.	L/1000.	L/1000.		
Naphthalene	L/200.	L/200.	L/200.		



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PAGE NO. 3

Pacific Wood Treating

LABORATORY NO. 8215

Note: Pentachlorophenol analyses were per Method 8040; Naphthalene analyses were per Method 8100.

Key

L/ indicates "less than"

Respectfully submitted,

Laucks Testing Laboratories, Inc.

Mike Nelson

MN:bg



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PAGE NO. 4

Pacific Wood Treating

LABORATORY NO. 82154

APPENDIX A

Total Solids

The following total solids determinations were made:

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>9</u>
Total Solids, %	82.2	79.6	80.1	83.9	80.7
	<u>11</u>	<u>13</u>	<u>15</u>	<u>17</u>	<u>18</u>
Total Solids, %	82.6	81.2	80.0	80.8	80.0
	<u>20</u>	<u>22</u>	<u>23</u>		
Total Solids, %	68.7	86.0	91.7		



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PAGE NO

5

Pacific Wood Treating

LABORATORY NO.

82159

APPENDIX B

Surrogate Recovery Quality Control Report

Listed below are surrogate (chemically similar) compounds utilized in the analysis of organic compounds. The surrogates are added to every sample prior to extraction to monitor for matrix effects and sample processing errors. The control limits represent the 95% confidence interval established in our laboratory through repetitive analysis of these sample types.

Sample No.	Surrogate Compound	ug/kg		% Recovery	Control Limits
		Spike Level	Spike Found		
Blank	Triisopropyl Benzene	5000.	4620.	92.4	87-118
1	"	5000.	5350.	107.	87-118
2	"	5000.	5750.	115.	87-118
3	"	5000.	4980.	99.6	87-118
4	"	5000.	4870.	97.4	87-118
9	"	5000.	5500.	110.	87-118
11	"	5000.	5700.	114.	87-118
13	"	5000.	5750.	115.	87-118
15	"	5000.	4860.	97.1	87-118
17	"	5000.	4620.	92.3	87-118
18	"	5000.	5000.	100.	87-118
20	"	5000.	5050.	101.	87-118
22	"	5000.	5100.	102.	87-118
23	"	5000.	5100.	102.	87-118
Blank	2,3,4,5-Tetrachlorophenol	5700.	4320.	75.8	69-102
1	"	5700.	5310.	93.1	69-102
2	"	5700.	5490.	96.4	69-102
3	"	5700.	5020.	88.0	69-102
4	"	5700.	5120.	89.9	69-102
9	"	5700.	5230.	91.7	69-102



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Certificate

PAGE NO. 6

Pacific Wood Treating

LABORATORY NO. 82151

APPENDIX B, cont.

Surrogate Recovery Quality Control Report

Sample No.	Surrogate Compound	ug/kg		% Recovery	Control Limit
		Spike Level	Spike Found		
11	2,3,4,5-Tetrachlorophenol	5700.	5600.	98.2	69-102
13	"	5700.	4820.	84.5	69-102
15	"	5700.	4130.	72.4	69-102
17	"	5700.	4910.	86.1	69-102
18	"	5700.	4770.	83.7	69-102
20	"	5700.	4780.	83.9	69-102
22	"	5700.	4350.	76.3	69-102
23	"	5700.	4290.	75.3	69-102



This report is submitted for the exclusive use of the person, partnership, or corporation to whom it is addressed. Subsequent use of the name of this company or any member of its staff in connection with the advertising or sale of any product or process will be granted only on contract. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

SEPTEMBER 1, 1983

PACIFIC WOOD TREATING CORPORATION IS HEREBY GRANTED PERMISSION TO SAMPLE MY WELL AT 3316 N.W. 289TH STREET, RIDGEFIELD, WASHINGTON.

SUCH SAMPLING TO BE ON AN INTERMITTENT BASIS AT NO COST TO ME. COPIES OF TEST RESULTS ARE TO BE FURNISHED TO ME AT NO COST.

DURATION OF THIS AGREEMENT IS FOR THIRTY YEARS OR LESS.

SIGNED

A handwritten signature in dark ink, appearing to read 'E. H. Falls', is written over a horizontal line.

EDWARD H. FALLS
OWNER



FOUNDATION ENGINEERING

20 September 1983

Sweet, Edwards & Associates, Inc.
P.O. Box 328
Kelso, WA 98626

Project P-132

RBT Closure

ATTENTION: Randy Sweet

Dear Mr. Sweet:

This letter summarizes our observations and test results associated with the RBT Closure project near Ridgefield, Washington.

Project Description

The project site is located near the intersection of NW 31st Avenue and NW 289th Street at the old Ridgefield Brick and Tile landfill. The closure work consisted of removing soft surface soils from within the bottom of an existing clay borrow pit and compacting a soil base approximately 3 feet thick. A 4-inch thick soil-bentonite liner was built over the soil base. The liner is intended to contain leachate from the adjacent fill which will be moved onto the improved area.

Field Observation and Testing

We observed the construction of the soil base and soil-bentonite liner over a two day period (15 and 16 September 1983).

The raw soil base was compacted using a towed, vibratory sheepsfoot roller. A total of twelve field density tests were run at three separate locations on the surface of the compacted base using a Troxler Model 3411B nuclear moisture/density gage. Four individual tests were run at each location so that a relatively large volume of soil could be tested. The soil base was tested to a depth of 6 inches (using the direct transmission mode).

The bentonite was placed on the site in 100-lb bags laid out in a 6 to 7 foot grid to provide an average application rate of 2.5 lbs. per square foot of liner. The bulk of the bentonite consisted of Saline Seal 100 (manufactured by American Colloid Company). A few bags of SG-40 bentonite were interspersed with the Saline Seal 100. It is our understanding that the exchange in bentonite was approved by the State of Washington.

The bentonite was spread by hand and subsequently raked. The bentonite and soil were then blended to a loose depth of about 6 inches using two passes of a tractor-towed rotovator. The soil-bentonite was subsequently rolled with one pass of a smooth, vibratory roller followed with several passes of a vibratory sheepsfoot roller. The top of the liner was proof rolled with the smooth roller to produce a smooth surface.

The completed liner was then sprayed with fresh water to hydrate the bentonite and subsequently covered with fill bulldozed from the adjacent area.

We ran a total of 35 field density tests on the surface of the liner at 12 separate locations. The testing was done on a wedge-shaped area approximately 120 by 150 feet in plan which had been completed at the time of our work. Our tests were located on a grid approximately 30 foot by 30 foot beginning near the northern corner of the liner. All tests were run to a depth of 4 inches (the design thickness of the liner).

Test Results

The results of the field density tests run on the soil base are summarized in Table 1. Tests No. 1 through 3 indicated that the soil base was compacted to densities equivalent to about 94 to 99% relative compaction (ASTM D-698). The results of the field density tests run on the soil-bentonite liner are summarized in Table 2. Those test results indicate that most of the soil-bentonite liner was compacted to densities equivalent to about 94 to 103% relative compaction. No densities below 90% relative compaction were noted.

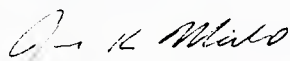
We ran two moisture-density curves on the native soil during previous testing (see enclosed curves). Those tests indicated a maximum dry density of between 100.5 and 103 pcf (ASTM D-698). An average maximum dry density of 101.8 pcf was used for the field density tests run on the soil base. We also ran three single moisture-density points on random samples of soil-bentonite obtained from the liner. Those tests indicated a maximum dry density of about 97 pcf. A maximum dry density of between 97 and 101.8 pcf was, therefore, assumed for the soil-bentonite liner.

Conclusions

We have concluded, based on our field observations and on the results of our testing, that the portion of the soil-bentonite liner we tested was compacted well above the specified minimum relative compaction of 90%. It is our opinion that the procedure used by the contractor to compact the liner was adequate to attain the desired densities. Therefore, we do not believe that additional testing is required on the remaining liner area if the same procedure is maintained.

It has been a pleasure assisting you with this phase of the project. Please contact us if you have any questions.

Sincerely,



James K. Maitland, P.E.

Enclosures

JKM/jlm

Table 1. Summary Test Results

<u>Test Number</u>	<u>Wet Density (pcf)</u>	<u>Water Content(%)</u>	<u>Dry Density (%)</u>	<u>Relative Compaction (%)</u>
1-1	122.6	20.9	101.4	99.6
1-2	121.8	22.0	99.8	98.0
1-3	122.7	22.5	100.2	98.4
1-4	120.4	22.7	98.1	96.4
2-1	120.4	22.7	98.1	96.4
2-2	120.5	23.4	97.6	95.9
2-3	119.2	24.9	95.5	93.8
2-4	118.7	23.7	96.0	94.3
3-1	118.4	19.9	98.8	97.0
3-2	116.9	21.2	96.4	94.7
3-3	118.2	20.7	97.9	96.2
3-4	119.6	20.6	99.2	97.4

Note: Tests were run on the compacted raw soil base.

Table 2. Summary Test Results

Test Number	Wet Density (pcf)	Water Content (%)	Dry Density (pcf)	Relative Compaction (%)
4-1	113.6	19.1	95.3	98.2
4-2	116.8	18.1	98.9	102.0
4-3	118.7	19.3	99.5	102.6
4-4	120.5	19.6	100.8	103.9
5-1	124.7	20.0	103.9	102.1
5-2	122.0	18.5	103.0	101.2
6-1	120.4	18.4	101.7	99.9
6-2	120.2	19.8	100.3	98.6
6-3	121.3	18.9	102.6	100.2
7-1	124.2	19.5	103.9	102.1
7-2	120.4	19.1	101.1	99.3
8-1	118.4	19.2	99.3	97.5
8-2	121.3	19.3	101.7	101.7
9-1	113.1	19.1	95.0	97.9
9-2	108.2	18.0	91.7	94.5
9-3	107.8	16.3	92.6	95.5
9-4	110.4	18.7	93.0	95.9
10-1	118.1	19.0	99.3	102.4
10-2	112.6	18.5	95.0	97.9
10-3	116.6	19.7	97.3	100.3
11-1	111.9	20.2	93.1	91.4
11-2	116.4	20.1	96.9	95.2
11-3	115.8	20.5	96.1	94.5
12-1	122.7	20.3	102.1	100.3
12-2	121.3	20.7	106.4	98.7
12-3	122.2	21.2	100.9	99.1
13-1	124.7	17.9	105.7	103.9
13-2	125.5	19.0	105.4	103.6
13-3	123.2	19.3	103.3	101.5
14-1	117.1	20.2	97.5	95.8
14-2	118.6	19.4	99.3	97.5
15-1	119.4	19.1	100.3	98.5
15-2	115.6	19.4	96.8	95.1
15-3	118.8	18.4	100.3	98.5
15-4	121.0	17.5	103.0	101.2

Note: All tests were run on the soil-bentonite liner to a depth of 4 inches.

COMPACTION TEST RESULTS

PROJECT NAME RBT Closure

PROJECT NUMBER P-132

DATE 4 July 1983

SAMPLE DESCRIPTION Brown to tan, low-plasticity sandy silt

SAMPLE LOCATION BH-1 and BH-2

SAMPLE WATER CONTENT see report text

TEST BY JKM

TEST METHOD

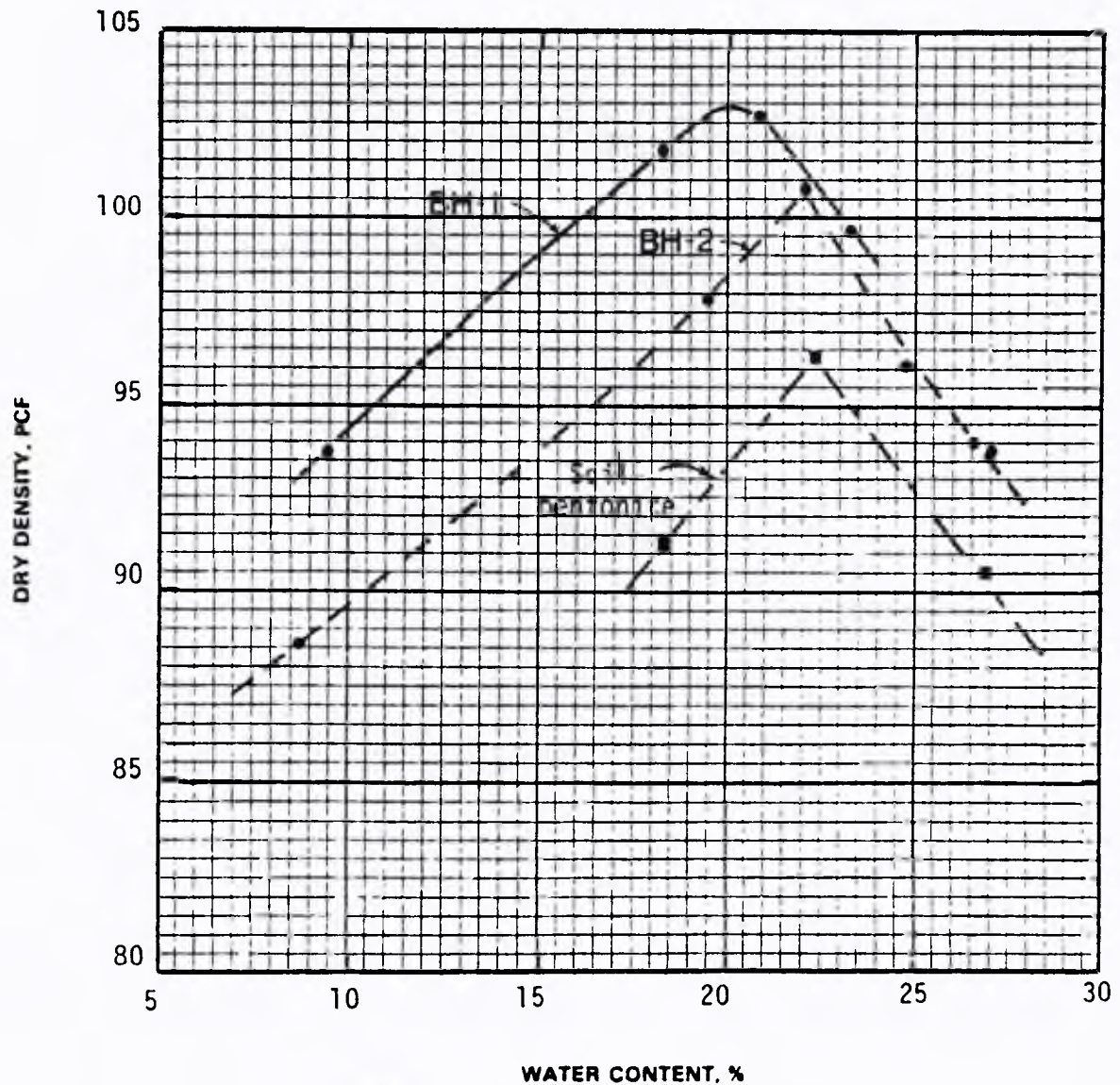
- ☒ ASTM D-698 (AASHTO T-99)
☐ ASTM D-1557 (AASHTO T-180)
☐ OTHER _____

TEST RESULTS

MAXIMUM DRY DENSITY see below pcf

OPTIMUM WATER CONTENT _____ %

SPECIFIC GRAVITY _____



PATRICK H. WICKS, P.E.

Consultant in Hazardous
Waste Management

October 14, 1983

SOIL LOGS

Logs of backhoe test pits excavated by PWT contractor September 23, 1983, 45 feet east of east wall of RBT warehouse along western margin of old disposal area:

1 4'4" deep; bottom 2 feet appear to be undisturbed native
(north) soil; no waste appears in pile of soil excavated from
 pit, one creosoted timber at edge of pit.

2 4'8" deep; bottom 2 feet appear to be undisturbed native
(south) soil; small amount of waste in pile of soil excavated from
 pit; according to contractor, this waste was tracked there
 during waste movement.

A handwritten signature in cursive script, reading "Patrick H. Wicks", is written over a solid horizontal line.

Patrick H. Wicks, P.E.

N.W. 289th Street

PROPERTY LINE

NOTE:

This drawing is based on surveys prepared by:
 1) Clark County,
 2) Niedermeyer-Martin Co.,
 3) Lawson Land Surveying and,
 4) onsite measurements by Sweet-Edwards.
 For detail of property boundaries and location of refuse area, see surveyors plat (in back pocket).

PROPERTY LINE

PROPERTY LINE

PROPERTY LINE

PROPERTY LINE

WAREHOUSE

REFUSE AREA

SURFACE DRAIN AND UNDERDRAIN SUMP *

TOE DRAIN SUMP **

STEEL PIPE

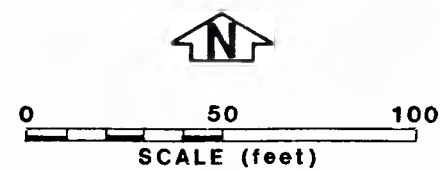
STAND PIPE

TOE DRAIN

STAND PIPE

FENCE

EXPLANATION



NOTES:

- * PIPE AND SUMP EXISTED PRIOR TO CLOSURE
- ** INSTALLED 11/30/83 (POST-CLOSURE MAINTENANCE).

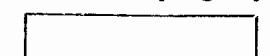


Sweet, Edwards & Associates, Inc.
 P.O. Box 328 • Kelso, WA 98626 • 206-423-3580

IN ASSOCIATION WITH:
PATRICK H. WICKS, P.E.
 CONSULTANT IN HAZARDOUS WASTE MANAGEMENT

* FINAL CLOSURE LAYOUT

**RBT SITE
 OPTION III**
 * Final Topography



Revised 5/9/84

DESCRIPTION OF COLOR PHOTOGRAPH REPRODUCTIONS

- | | |
|----------|--|
| PLATE 1 | Waste disposal area and adjacent pond prior to closure, 4/25/83. |
| PLATE 2 | Waste disposal area and adjacent pond prior to closure, 4/25/83. |
| PLATE 3 | Initial construction for closure, 9/14/83. |
| PLATE 4 | Initial construction showing underdrain trenches, 9/14/83. |
| PLATE 5 | Construction of bentonite - amended liner, phase 1, 9/16/83. |
| PLATE 6 | Initial removal of waste from old disposal area and placement on phase 1 of completed bentonite-amended liner, 9/18/83. |
| PLATE 7 | Construction of phase 2 bentonite-amended liner, 9/19/83. |
| PLATE 8 | Construction of phase 2 bentonite-amended liner, 9/19/83. |
| PLATE 9 | Movement and placement of waste on phase 2 liner, 9/19/83. |
| PLATE 10 | Near completion of waste removal from old disposal area showing contact between waste and underlying native soil (note: dramatic color difference), 9/20/83. |
| PLATE 11 | Near completion of waste removal from old disposal area showing contact between waste and underlying native soil (note dramatic color difference), 9/21/83. |
| PLATE 12 | Equipment decontamination following waste removal, 9/22/83. |
| PLATE 13 | Construction of toe drain, 9/22/83. |
| PLATE 14 | Initial construction of top seal for new encapsulation area, 9/23/83. |

All dates in the above description refer only to the date on which these photographs were taken.

DESCRIPTION OF COLOR PHOTOGRAPH REPRODUCTIONS - continued

- PLATE 15 Construction of toe drain near distribution box and test pits along margin of old waste disposal area, 9/23/83; construction of top seal, 9/24/83.
- PLATE 16 Partial completion of top soil application, 9/26/83.
- PLATE 17 Construction of the tight lines from toe drain and underdrain to southwest corner of warehouse, 9/27/83.
- PLATE 18 Completed construction on toe drain and underdrain tight lines; construction on gas vent system at eastern margin of new encapsulation area, 10/5/83.
- PLATE 19 Closure complete, 11/16/83.
- PLATE 20 Closure complete, 11/16/83.

All dates in the above descriptions refer only to the date on which these photographs were taken.



FROM WEST TO N.E.



FROM WEST TO EAST



FROM WEST TO EAST





Looking East - North Side
to South-East



From North - South



From North - South

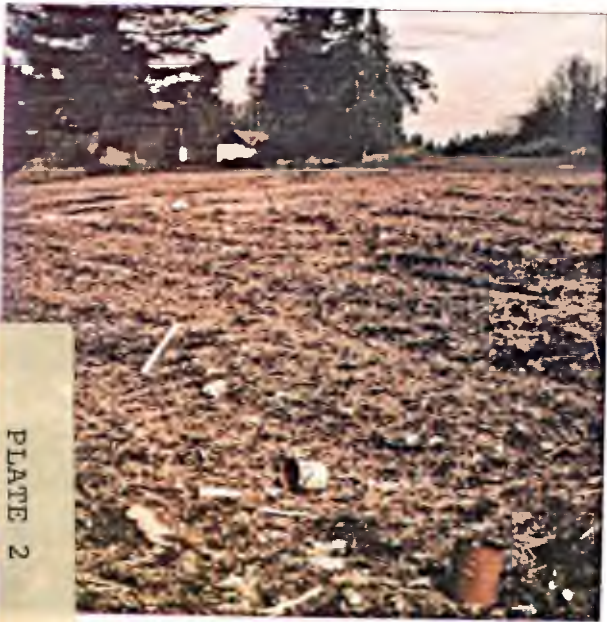


PLATE 2

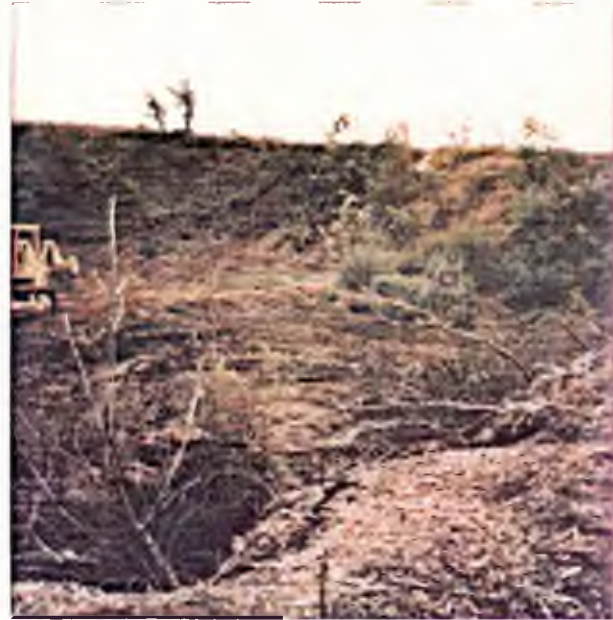




9-14-83
AM



9-14-83
AM



9-14-83
A.M.



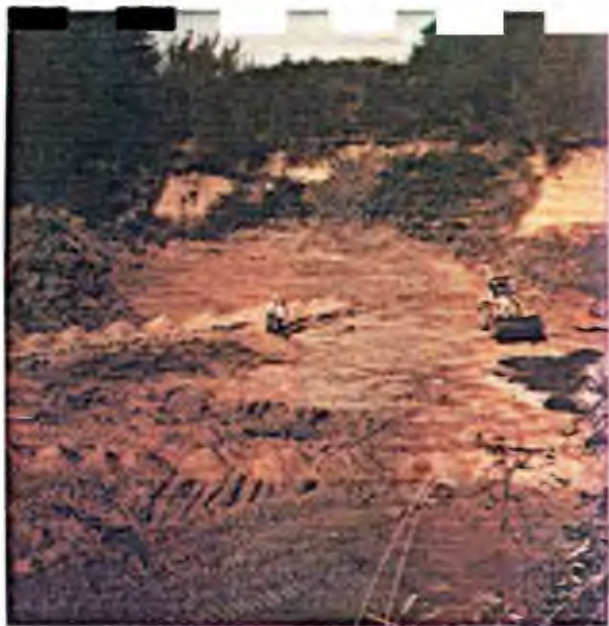
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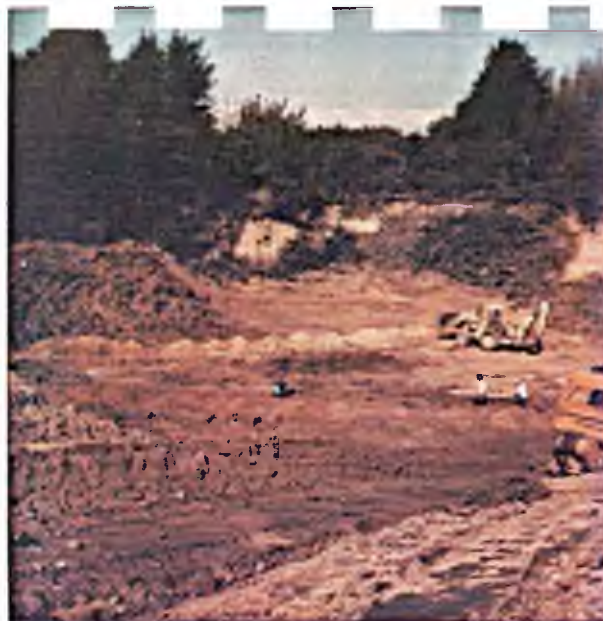
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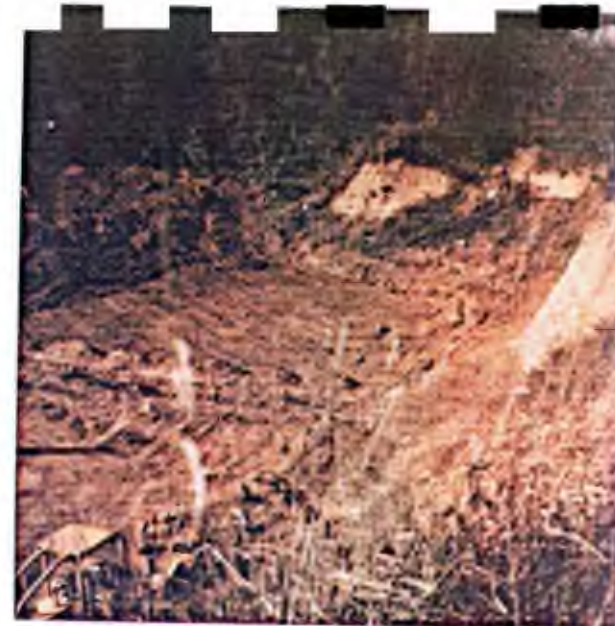
9-14-83
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9-14-83
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PLATE 4

9-14-83
PM



9-14-83
PM



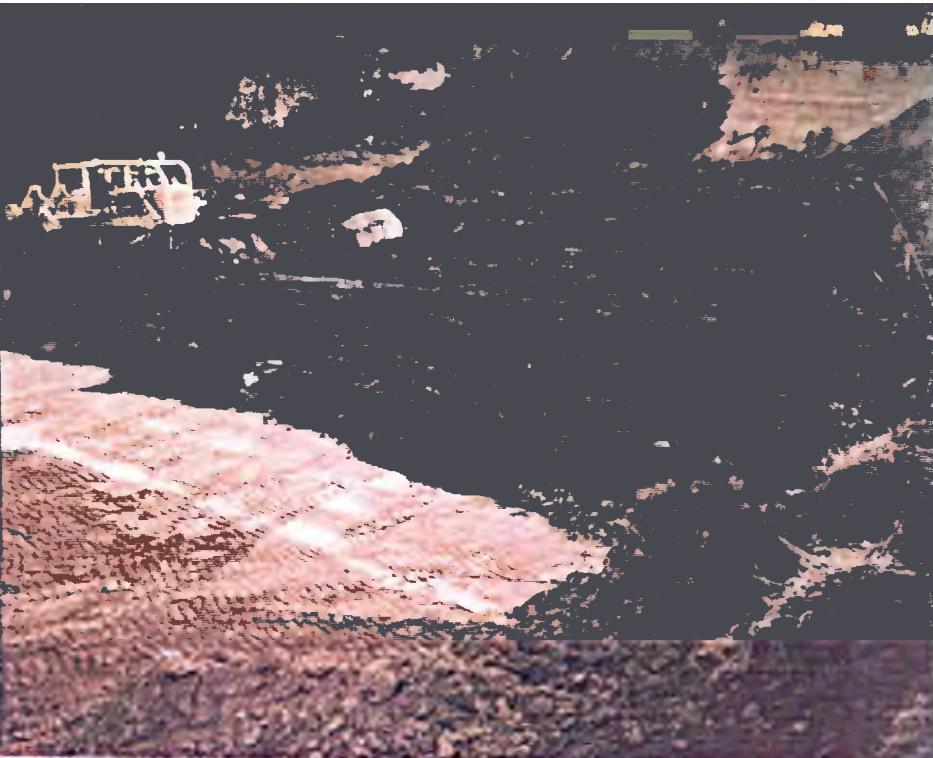
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9-16-83



PLATE 5



9-18-83

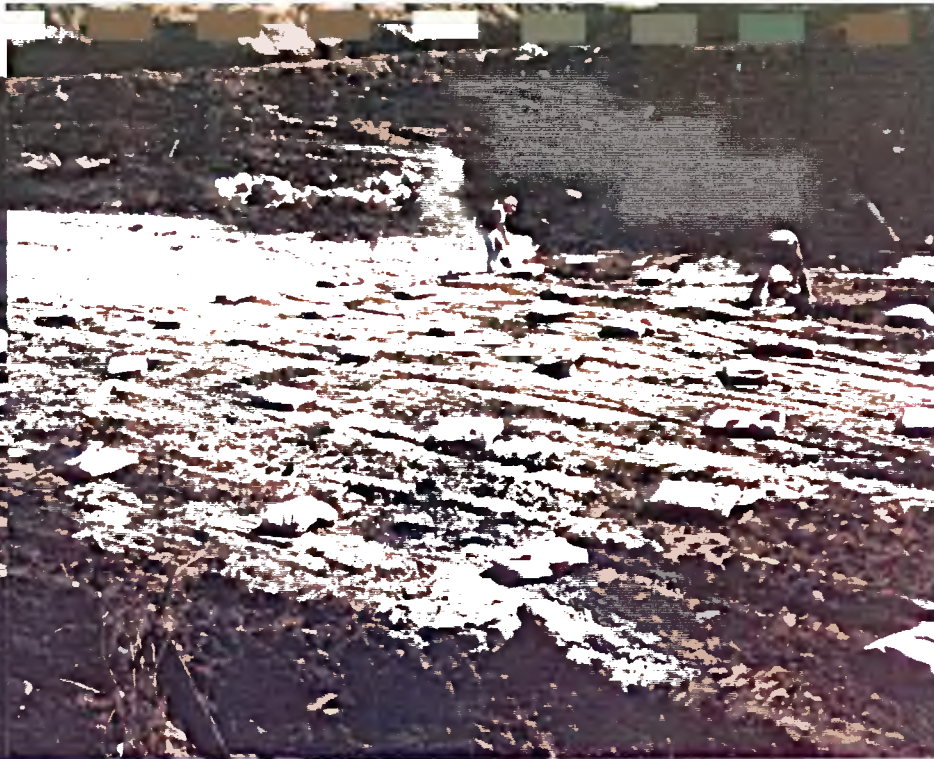


PLATE 6



9-19-83





9-19-83





9/19



9/20



9-21-83



PLATE 11



9-22-83



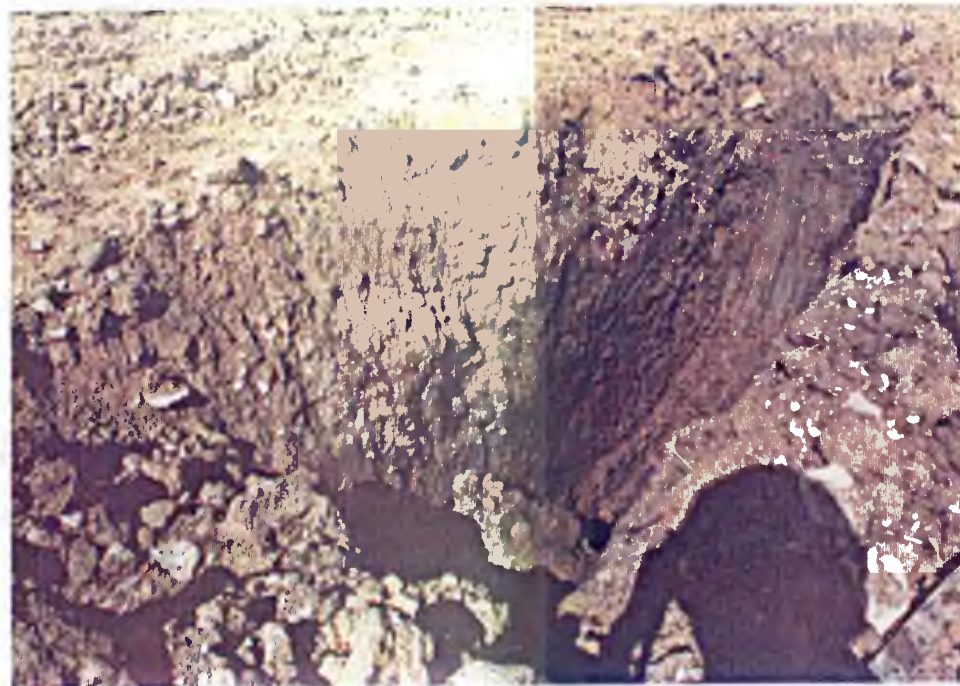


9-22-83



9/23





9/23



9/24



9-26-83



9-27-83





10-5-83



VENT DITCH
11' TO WASTE CONTACT





REFERENCES

Washington Department of Ecology, 1983. Notice of Penalty
No. DE 83-283.

Sweet, Edwards & Associates, Inc. and Patrick H. Wicks,
1983. Draft Closure Plan for Ridgefield Brick and Tile
Site, Ridgefield, Washington.

Washington Department of Ecology, August 4, 1983. Letter to
Pacific Wood Treating Corporation.

Sweet, Edwards & Associates, Inc. and Patrick H. Wicks,
1983. Addendum to Draft Closure Plan, Ridgefield Brick
and Tile Site, Ridgefield, Washington.